

Leg I

1. The R/V *Yuzhmorgeologiya* departed Punta Arenas, Chile via the eastern end of the Strait of Magellan and proceeded to Admiralty Bay, King George Island to deliver supplies and personnel to the field camp.
2. The acoustic transducers were calibrated in Admiralty Bay, King George Island. The transducers, operating at 38 kilohertz (kHz), 120kHz, and 200kHz, were hull-mounted and down-looking. Standard spheres were positioned beneath the transducers via outriggers and monofilament line. The beam patterns were mapped, and system gains were determined.
3. The ship visited the Cape Shirreff and the Copacabana field camps to deliver provisions and supplies in the beginning of Leg I.
4. Survey components included acoustic mapping of zooplankton, direct sampling of zooplankton, Antarctic krill demographics, physical oceanography and phytoplankton observations were obtained. A large-area survey of 95 Conductivity-Temperature-Depth (CTD) and net sampling stations, separated by acoustic transects, was conducted in the vicinity of Elephant, Clarence, King George, and Livingston Islands (Survey A, Figure 3). Stations are located in four areas: stations to the west of Livingston and King George Islands are designated the "West Area," those to the south of King George Island are designated the "South Area," those around Elephant Island are called the "Elephant Island Area" and those south of Elephant Island are called the "Joinville Island Area". Acoustic transects were conducted at 10 knots, using hull-mounted 38kHz, 120kHz, and 200kHz down-looking transducers. Operations at each station included: (a) vertical profiles of temperature, salinity, and oxygen, and measurements of chlorophyll at 5 meters depth; and (b) deployment of an IKMT to obtain samples of zooplankton and micronekton.
5. Optical oceanographic measurements were conducted, which included weekly SeaWiFS satellite images of surface chlorophyll distributions and *in-situ* light spectra profiles.
6. Continuous environmental data were collected throughout Leg I, which included measurements of ship's position, sea surface temperature and salinity, fluorescence, air temperature, barometric pressure, relative humidity, wind speed, and wind direction.
7. An Antarctic fur seal pup survey was conducted at selected sites throughout the South Shetland Islands at the end of Leg I.
8. The ship returned to Punta Arenas via the western end of the Strait of Magellan at the end of Leg I.

Leg II

1. The R/V *Yuzhmorgeologiya* departed Punta Arenas, Chile and proceeded to Cape Shirreff to deliver supplies and personnel to the field camp.
2. A high-resolution survey for krill and oceanographic conditions was conducted in the vicinity of Cape Shirreff (Figure 2). A specially-outfitted Zodiac, R/V *Ernest*, conducted a series of acoustic transects, CTD deployments and underwater video observations within 15 miles of Cape Shirreff. The ship complemented these measurements on a coarser grid further offshore, deploying an Isaacs-Kidd Midwater Trawl (IKMT).
3. Total target strength measurements (TTS) were conducted at Cape Shirreff using live zooplankton from the IKMT sample. Following acoustic measurements, morphometric measurements were made and animals photographed.
4. An instrumented buoy was deployed in the near-shore area of Cape Shirreff in water shallower than 100m. The buoy radio-telemetered data to a monitoring station at Cape Shirreff and was recovered at the end of Leg II.
5. A large-area survey of 95 Conductivity-Temperature-Depth (CTD) and net sampling stations, separated by acoustic transects, was conducted in the vicinity of Elephant, Clarence, King George, and Livingston Islands (Survey D, Figure 2). Stations are located in four areas: stations to the west of Livingston and King George Islands are designated the "West Area," those to the south of King George Island are designated the "South Area," those around Elephant Island are called the "Elephant Island Area" and those south of Elephant Island are called the "Joinville Island Area". Acoustic transects were conducted at 10 knots, using hull-mounted 38kHz, 120kHz, and 200kHz down-looking transducers. Operations at each station included: (a) vertical profiles of temperature, salinity, and oxygen, and measurements of chlorophyll at 5 meters depth; and (b) deployment of an IKMT to obtain samples of zooplankton and micronekton.
6. Optical oceanographic measurements were conducted, which included weekly SeaWiFS satellite images of surface chlorophyll distributions and *in-situ* light spectra profiles.
7. As on Leg I, continuous environmental data were collected throughout Leg II.
8. At the end of Leg II, the ship then transited to Cape Shirreff to embark personnel and close the field camp.
9. Following the completion of the close of Cape Shirreff, the acoustic transducers were calibrated in Ezcurra Inlet, Admiralty Bay, and King George Island. The Copacabana field camp was closed and field personnel were retrieved.
10. The ship returned to Punta Arenas at the end of Leg II.